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"I'll show you how!" Children's learning about drawing and collaboration using MyPaint

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ABSTRACT
Two groups of children in early childhood education explored MyPaint with a graphics tablet. Data on the appropriation of the software by the children and on important dimensions of their learning of/with the software were collected. Two aspects of the analysis are presented: the learning about drawing, with transfers from the software to traditional drawing, and the collaboration for learning, focusing on how this experience changed the group dynamics when using the computer.

Keywords
Early Childhood Education, Free Software, Arts Education

1. BACKGROUND OF THE STUDY
In the first edition of the Master's Degree in Early Childhood Education (ECE) in the Higher School of Viseu (Polytechnic Institute of Viseu), special attention was given to Information and Communication Technologies (ICT) as a teaching and learning tool. The 16 students were already teachers, with more than 20 years of professional experience. A challenge was presented, regarding the discussion of Free Software in schools based on examples of use with children. Each teacher was asked to choose a software and a input device (white board, graphics tablet) and conceive learning experiences relevant for their group.

Our background for using ICT in ECE is based on Papert's perspective of children driving the technology [1] in self-directed and socially relevant ways [2], as mind tools [3]. The view of children as sharing a "participatory culture" [4], as the new tespians of a "collective intelligence" [5], requires from early childhood education critical decisions regarding software. In the conception of such critical perspectives, the children's experience and voice about it is regarded as essential [6] [7].

The poster presents two of the experiences developed in different ECE centers. In the two cases, the free software MyPaint was used together with a graphics tablet. Data was collected through observation, artifact analysis, photographs and recordings of children's interactions during the sessions. Permissions from the children were collected and anonymity preserved.

2. THE SETTINGS
A short description of each setting is presented:

Setting A: a) Urban School with 4 ECE classes and 15 primary classes (+/-420 children total), group of 21 children, ages 3-6 years old, with one female teacher. b) Classroom organized in interest areas: one computer in the room (old, constant problems) – used in free choice activities by the children, autonomously. c) Learning regarding social and personal development is highly valued. Conflicts and problems are discussed by everyone. Drawing is strongly invested has a form of representation of children's knowledge and sense making.

Setting B: a) Urban school with 2 ECE classes and 4 primary school classes (+/-125 children total), group of 20 children, ages 3-6 years old, with one female teacher. b) Classroom organized in interest areas: one computer in the room (old, slow) – used in free choice activities by the children, autonomously. c) Drawing is one of the favorite activities. Children like to use the computer. Conflicts arise when many want to use it at the same time.

3. FREE SOFTWARE
Free Software refers to computer programs distributed under a license that grants the user the freedom to run, copy, distribute, study, change and improve the software. Some of several arguments for using Free/Libre Software are critical for educational settings. For the FSF [8], the main reasons are: a) "schools should teach the value of sharing by setting an example", b) social responsibility, c) "the school itself gains independence from any commercial interests and it avoids vendor lock-in", d) "students are free to study how the programs work and to learn how to adapt them for their own needs", and e) financial savings and the overall quality of several already available Free/Libre Software solutions for education.

3.1 MyPaint
MyPaint (http://mypaint.intilinux.com/) is a Free/Libre Software graphics application for digital painting. The software provides a simple and clean interface and was designed for pressure sensitive graphics tablets, although you can use it with a mouse. It also features a large collection of brushes that emulate real media (ink, charcoal, etc.) and a highly configurable system of options that allows modification and creation of brushes. MyPaint is available for Windows, GNU/Linux and Mac operating systems.

4. "LET'S TRY SOMETHING NEW!" - DESCRIPTION OF THE EXPERIENCE
In both contexts, the approach was similar. In a large group meeting, the adult introduced the new software by showing its interface and some features (the work space, different brushes and colors). The graphics tablet was also shown and shortly demonstrated. The main focus was on the idea that this was something which was now in the classroom and children could use it. Both groups negotiated access to the computer and the graphics tablet by using the already existing structure: a) use it in the free choice activities time, b) two children at a time (already settled for computer use), c) review of safety rules when using the computer. Both teachers highlighted the group interaction as something which they wanted to promote from the outset.

Children's autonomy in both setting the rules and organizing the groups and the time management for the first exploration was also strongly valued in both settings.

In setting A, a very lively and diverse use of the software ensued. The emphasis placed by the teacher in children's authorship of the learning and the daily life in the classroom was visible. Groups of two to three children spent large amounts of time drawing, testing brushes and colors. The sharing of discoveries (not every feature of the software was disclosed by the adult) was made with enthusiasm. Small gatherings around the computer meant something new was tried by someone and there was an opportunity for learning. This process of learning from each other was promoted by the teacher, suggesting that doubts were cleared with children who knew the solution, not by adult intervention. The teacher also organized large group discussions for sharing final drawings and descriptions of processes developed ("how did you do it?"). This was a time of rich learning: children asked many questions and shared both successful risks and difficulties or mistakes. What each had done was put together for and by the group.

In setting B, children followed what had been agreed, exploring the software and the graphics tablet in pairs. The difficulties felt – what to do next, where to find a specific brush, how to change color – usually led to a request of adult support. It was decided to have a small time with each group of children to assist in the beginning and then promote more autonomous use. The children changed pairs in the following days and kept their creations flowing. Soon, some children were more capable of using the software and knew more features of it, through autonomous exploration. Some requests for help between children happened and the sharing and support was enough for the adult support to be unnecessary. Successes were still mostly celebrated with the teacher, though, called to see and acknowledge the pieces and to validated new features of the software when they were discovered. The communication to the large group was centered in the presentation of the drawings for celebrating the accomplishments.

5. "HOW DO I BLUR THE PENCIL?" - LEARNING ABOUT DRAWING

The possibility of erasing and overlapping layers of colors or brushes was immensely explored by the children. A lot of time and attention was devoted to brushes like grass, fur, leaves, dna, particles, beam-light or glow, which were discovered by the children through exploration.

In setting B, the teacher reported how children were interested by the fact they could erase what had been done and do it again or change the way it was done. The possibility of controlling this processes was more significant than the final result.

In setting A, the discovery of each brush was welcomed and celebrated and different uses were attempted. An example of transfer of knowledge from the software to traditional drawing has to do with MyPaint using the pressure sensitivity of the tablet in order to create a series of effects, allowing for smudging and blurring, when combined with the right brushes. Different brushes also allow for painting with different lines like airbrush or charcoal. When drawing on paper, a small group of children in setting A started to explore the pens and the pencils with which they usually drew, trying to achieve similar effects, expressing questions like "How do I blur the pencil?". Children found solutions for this like tilting the pencils for a larger smudged line.

6. "I'LL SHOW YOU HOW" - LEARNING WITH THE HELP OF OTHERS

In both settings, only one computer existed. No extra equipments were allocated to the experience. This meant children had to share and wait for their turn to use something new and appealing. Both teachers had expressed some concerned regarding possible problems with this. In setting B, conflicts about time in the computer were fairly common before the experience. The observations showed patience in waiting for their turn, but also that children observed, without interfering, what others did in their time. The sense that there were many features to discover, maintained everyone's interest not only in the program but in its use by others. On the other hand, when the older or more fluent children tried to impose their knowledge on others, it did not led to conflict as it usually did. Children understood early on that being able to ask colleagues for help was a good way to solve problems. "I didn't know how to do it... where the delete was... but then Raquel found out and she told us. It was cool!".

The large group sharing, valued by both teachers, was important for this, making the knowledge flow and the learning shared by the collective. But the open nature of the tasks was also important. In the educational games children played there was a right answer. If someone helps you, it's usually by giving you the right answer. Showing that you can zoom in or out (one of the discoveries) doesn't replace you in your creative process; sharing a new found brush only feeds your creativity, doesn't close any process. Presenting the software in a way open to exploration and discovery [9] was crucial for this collaborative process since everyone had something to learn but also to teach.

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